DOCUMENT RESUME

ED 352 166 PS 020 957

AUTHOR Dickson, LouAnn S.
TITLE Focus on Fundamentals: A Longitudinal Look. Research Report 63.
INSTITUTION Mesa Public Schools, AZ. Dept. of Research and Evaluation.
PUB DATE Jul 91
NOTE 44p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; *Back to Basics; *Basic Skills; College Entrance Examinations; Comparative Analysis; *Elementary School Students; Elementary Secondary Education; Extracurricular Activities; Interpersonal Relationship; Longitudinal Studies; Outcomes of Education; Public Schools; Standardized Tests; Student Characteristics; *Traditional Schools
IDENTIFIERS *Fundamental Schools; *Mesa Public Schools AZ

ABSTRACT

To examine long-term effects of a fundamental elementary education in Mesa (Arizona), this study assessed student characteristics, academic achievement based on standardized testing, and social interactions based on high school extracurricular activities. Students who had attended the fundamental school for 6 complete years, had remained in the Mesa Public Schools system, and had completed grade 9 or higher were selected to provide adequate longitudinal test data. Two comparison schools were used. Data were collected on standardized testing at grades 6, 9, and 11; Scholastic Aptitude Test and American College Testing program scores; and several characteristics of enrollment patterns and academic achievement. The results show that, compared to students in the comparison schools, students in the study sample: (1) are not remarkably different; (2) score higher on some test subscales at grade 6, but not at grades 9 or 11, or on college entrance examinations; (3) do not take more advanced placement courses; (4) do not achieve more honors, but do participate in more school activities and are in more leadership positions; and (5) have higher percentages of withdrawals to private or home schools and transfers within the district. Similar children learned about equally well regardless of the philosophy of the elementary school they attended. Three figures and nine tables present study findings. (SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED352166

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

FOCUS ON FUNDAMENTALS: A LONGITUDINAL LOOK

BY

DR. LOUANN S. DICKSON

DEPARTMENT OF RESEARCH & EVALUATION

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
J. S. DeGrace
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

MESA PUBLIC SCHOOLS

PS 020257

BEST COPY AVAILABLE

FOCUS ON FUNDAMENTALS:
A LONGITUDINAL LOOK

BY

DR. LOUANN S. DICKSON

DR. JAMES K. ZAHARIS
SUPERINTENDENT

MR. DAVE EAGLEBURGER
ASSOCIATE SUPERINTENDENT
EDUCATIONAL SERVICES

DR. JAMES S. DEGRACIE
DIRECTOR, RESEARCH AND EVALUATION

MESA PUBLIC SCHOOLS
JULY 1991

RR63

TABLE OF CONTENTS

Page

Executive Summary i

Introduction

- Historical Perspectives 1
- Definitions of Fundamental Schools 3
- Opposing Viewpoints 4
- Student Achievement 7

Mesa Public Schools Fundamental School

- Program Description 9
- Student Characteristics 10

Methodology

- Research Questions 11
- Subjects 12
- Data Collection 13
- Design 16

Results

- Student Achievement: Grade 6 16
- Student Achievement: Grade 9 17
- Student Achievement: Grade 11 18
- Score Changes Grade 6 to Grade 9 20
- Score Changes Grade 9 to Grade 11 21
- Score Changes Grades 6 to Grade 11 21
- Student Achievement: ACT/SAT Exams 22
- Other Student Activities 23
- Withdrawal Patterns 24

Discussion

- Student Achievement 26
- College Entrance Exams 31
- Class Standing 32
- School Activities and Participation 32

Summary 33

References 35

TABLE OF CONTENTS

Page

TABLES

Table 1: Sample Distribution....13

Table 2: School Profiles: Ethnicity, Language, Dwelling and Parents....15

Table 3: Means & Standard Deviation for Otis-Lennon SAI Scores....16

Table 4: Grade 6: Adjusted Means & Standard Deviation for Standardized Tests....16

Table 5: Grade 9: Adjusted Means & Standard Deviation for Standardized Tests....17

Table 6: Means & Standard Deviations from Sixth to Eleventh Grade by School Across Standardized Tests....19

Table 7: Adjusted Means, Standard Deviations, and Percent of Students Siming for ACT & SAT Exams....23

Table 8: Means & Standard Deviations for Selected Student Activities....24

Table 9: Withdrawals by Code....25

FIGURES

Figure 1: Comparative Directional Changes in Test Scores: Grade 6 to Grade 9....20

Figure 2: Comparative Directional Changes in Test Scores: Grade 9 to Grade 11....21

Figure 3: Comparative Directional Changes in Test Scores: Grade 6 to Grade 11....22

EXECUTIVE SUMMARY

During the 1989-90 school year, the first group of students to have completed all six years at the district fundamental school graduated from high school and three additional groups of students who had attended 6 years had completed junior high school. To examine long-term effects of a fundamental elementary education we designed a study which delineated student characteristics, academic achievement as measured by standardized testing and social interactions as measured by high school extra-curricular activities.

Students who attended the fundamental school for six complete years and had remained in Mesa Public Schools since that time were identified and included in the study. Only students who had completed grade nine or more were selected to ensure adequate longitudinal test data. Two comparison schools were selected based on an ability index, free and reduced lunch, student mobility, non-two parent families and proportion of minority students. Because there is some reason to believe that many students at the fundamental school are member of the Church of Jesus Christ of Latter-day Saints (LDS), an additional consideration in selection of one comparison school was that it served an area presumed to have a high proportion of students who are LDS. The district keeps no records on religion, however, so these assumptions have no data to support them. Students from the comparison schools were required to meet the same criteria as those from the fundamental school for inclusion in the sample.

Data was collected on standardized testing at grades 6, 9 and 11, SAT and ACT college entrance exams, class standing, number of honors classes taken, attendance, dropout and withdrawal patterns, school leadership positions, academic honors and participation in school activities. Our research reveals that students who consistently attend a fundamental school throughout their elementary school years:

1. do not differ remarkably from our comparison schools except in a somewhat higher index of ability when compared with one school.
2. score higher than comparisons school students on some subscales of standardized tests at grade six but not at either grade nine or grade eleven. There are no differences in college entrance exam scores but there are differences in type of test taken.
3. do not take more advanced placement courses than comparison school students.

4. do not achieve more academic honors in high school, but do participate more in school activities and are found in leadership positions more often than are comparison school students.

5. exhibit somewhat differing rates of dropout, withdrawal, or absenteeism than do comparative school students. Fundamental school has a higher percent who withdraw to private or home schools and a higher percent who may transfer within the district.

This 13-year longitudinal study of the effects of education at a fundamental school upon students academic and social performances found an initial scholastic advantage at sixth grade, for Fundamental students in math and on one test of language and work study. These differences had been eliminated by ninth grade and all schools remained similar at eleventh grade. There were varying patterns in college entrance exams with Fundamental students demonstrating higher means but not significant differences. More interesting were the patterns where students from one comparison school took exams required by more challenging, out of state and private institutions while Fundamental students and students from the other comparison school primarily took exams required by western state colleges and universities and religious institutions. When we examined student activities in high school, Fundamental students participated more and held more leadership positions, but did not attain more academic honors.

Despite years of controversy and heated exchange both on a national and local level, our study indicates that while there may be some participation differences, many of these could be the effect of variables outside the school system. Short-term, fundamental students out perform comparison schools in math and some other subscales of standardized tests. Long-term, students fared equally well academically regardless of the philosophical approach of the elementary school they attend. Fundamental students perform well and remain excellent performers in high school, but then, so do students from the comparison schools. We are comparing excellence to excellence. What may be more important is that parental philosophies often differ, making parents psychologically more comfortable when their children attend a particular type of school. This is characteristic of a heterogeneous, open society where people are free to have differing opinions and to express themselves and the district has adapted to provide a range of options for parents and children of varying persuasions. The important, underlying concern is not the dialectic involved, but the end result: how well do children learn? Similar children in our study learned about equally well in the long term regardless of the philosophical underpinnings of the elementary school they attended.

INTRODUCTION

The decade of the 60's saw a reactive disintegration of the tight social structure of the prior decade. The relative permissiveness of the decade was accompanied by a perceived erosion of traditional American standards of decorum that alarmed some citizens: The buttoned-down world of the Eisenhower administration dissolved into drugs, divorce, flower children and Vietnam protesters. These changes were reflected in American school systems as the tightly structured and controlled classroom of the 1950's evolved into open classrooms, student empowerment and, in some cases, a siege mentality. Standardized achievement scores seemed to plunge and discipline problems seemed to multiply. The early 70's saw the birth of a counter-reaction to this perceived permissiveness in the back-to-basics philosophy. Mason (1980) proposes that underlying this reaction was a "dissatisfaction, either founded or unfounded, of a significant portion of the school district patrons with the educational programs available to them."

Historical Perspectives. Yet this "Back to Basics" movement, popular for the last decade, is really a "not-so-new back-to-basics" movement. In this century we can document at least 3 educational reform movements characterized by a common complaint: progressive trends in education were producing illiterate graduates.

The Essentialist movement surfaced in the 1930's and proposed that, to properly prepare students for adulthood, schools must focus on reading, writing, arithmetic, history and English as well as stressing discipline and obedience (Meyer, 1949; Bagley, 1938). Bagley noted that not only were American high schools scholastically inferior, but that they were graduating students who were illiterate. The teaching of reading at lower grades was so poor that he recommended remedial reading classes at the high school level. Bagley's voice echos across the decades intervening since the 1930's to tell us that the crime rate has increased simultaneously with increased school attendance and indicates that if schools were effective the crime rate should be decreasing. He deplored the passing of students 'on schedule' (page 245) as producing graduates who were academically unprepared and lacking in mastery of the fundamentals.

By the 1950's the baby boomers had begun to enter school and nationally educators were preoccupied with producing enough teachers and school facilities to meet the growing demand. The nation had been shaken by post-war mobility, affluence and the spectre of the cold war.

Education responded to these stresses with classes designed to help individuals adjust, producing a plethora of classes rarely seen in American schools before: career and sex education, community work, vocational and home economics classes and child development were, in some cases, supplanting the traditional academic courses. Beginning in 1957 with the launch of Sputnik by the U.S.S.R., challenges to the American educational system increased. Arthur Bestor, Max Rafferty and Hyman Rickover reiterated the complaints of the earlier Essentialists comparing American schools unfavorably with European approaches. These critics of the 50's were particularly unhappy that the traditional curriculum was being displaced by the new adjustment-based courses. They called for a return to studies of English, math, science, history and foreign languages (Gutek, 1981).

Any steps toward widespread implemeentation of these changes were lost in the turbulence of the 1960's: assassination, rebellion, Vietnam and Watergate preoccupied the nation. Teachers and students at all levels were socially and politically involved. Lyndon Johnson's "Great Society" programs shifted governmental focus from basic academic subjects to compensatory programs such as Chapter 1 and bilingual education (Gutek, 1981). But, by the mid-seventies, the nation was again hearing critics decrying the state of education and proposing a return to "basics" as the only solution of a crumbling educational institution and the present movement was born.

As we examine these reform movements we can see certain commonalities. Each movement: 1) developed after a period of national crisis and social turmoil, 2) believed their students lacking in comparison to prior eras or European students and 3) urged a return to earlier curriculum and methods.

There is no real agreement that students are less able to read and write than in prior decades. Gerard (1977) quotes the following:

> "Each class that comes into college has read fewer and fewer of what are called the classics of English literature. An increasing proportion of the sons and daughters of the prosperous are positively illiterate."
>
> --Kathryn F. Gerould

Gerard notes that Gerould wrote this in the last 1920's. He also notes that often under the "old" system a teacher started with 100 students in grade one and at grade 13 only 5 or 6 had not failed out and questions whether that system was an improvement.

Brodinsky (1977) reporting on the Wingspread Conference of 1977 observes that technological changes have affected American educational systems in subtle but important ways. He observes that writing is no longer the primary mode of communication. Since the advent of telephones more people pick up a phone to communicate than write letters, memos or notes. This technology indicates that "writing" might well be broadened to "communications" in the curriculum and include reading, speaking and listening skills as well as writing. Brodinsky also observes that the reading ability of American children is "formidable," but admits that the push for quantity in education has sometimes not provided quality.

Definitions of Fundamental Schools. One of the earliest manifestations of the back to basic movement of the 1970's was seen in the Marshall Fundamental School in Pasadena, California which opened in the fall of 1973 (Neil, 1976; Jones, 1976). Most "basic" or "fundamental" schools have much in common, including an emphasis on reading, writing and mathematics. In addition, there is strict discipline both inside and outside the classroom and emphasis on teaching traditional values and patriotism. These criteria are by no means universal and there is little agreement even within the movement itself as to what actually comprises a fundamental school.

Palardy (1988) proposed that much of the debate about basis schools relates to a perennial problem in education: inability to define or agree on terms and perceptions. He identifies at least eight different concepts attached to the phrase "back to basics". These concepts include amount and type of funding, approaches to discipline, type of student who should be educated by public schools, moral or character education, appropriate intellectual objectives, emphasis on difficult subject material, diminished student decision-making and high competency standards accompanied by frequent evaluation.

Apple (1988) proposed that fundamental schools are actually a "neoconservative program" that is designed to make more rigorous demands on both students and teachers. These include a return to basics, accompanied by standardization of the curriculum, eliminating educational frills, heavy reliance on competitive standardized testing, close tracking, lengthening the period of schooling in both days and hours per day and instituting strict promotion and graduation requirements.

Areas of study are determined by faculty and parents and student choice is not an issue. Attendance is by choice and no special student criteria are established, presumably producing a cross section of any district's students. Mason (1980) describes fundamental schools as those that have been specifically designed to have an emphasis on instruction in basic skills and methods of instruction. Excluded from the curriculum are such areas as career, values, sex and life style

education, anthropological and sociological studies, and extended fine arts classes. Mason further proposes that fundamental schools demonstrate the following characteristics: emphasis on skill development, intellectual training, competition against specific standards, setting and enforcing rules of discipline and decorum and respect for authority, country and others. Weber, McBee, Burton and Wildman (1985) studied fundamental schools modeled after the John Marshall Fundamental School in Pasadena and described the emphasis in these schools as being on reading, writing and mathematics and on discipline, supporting Mason's earlier descriptions.

Protestations to the contrary, when one examines the curriculum of basic schools it is obvious that values and life style education are not only included but heavily emphasized. The emphasis, as Mason described, on such areas as discipline, patriotism, competition, decorum and respect for authority and country certainly reflect values and life style education and very probably anthropological and sociological studies too These areas of emphasis are unrelated to any fundamental curriculum of reading, writing and mathematics. What appears to be operational here is that values and life style education as well as anthropological and sociological studies are being taught in fundamental schools. However, they are acceptable because they reflect so basically the values and life styles of the parents and advocates.

Opposing Viewpoints. There is, by no means, universal agreement on the effectiveness of the back to basics approach to education. In our review of the literature, articles were heavily dominated by opponents of the programs. Proponents seem to publish few articles and little research, but argue convincingly that schools cannot be all things to all people but instead should focus on doing what public schools were originally mandated to do: educate students. Time and resources should not be expended in providing instruction in a broad range of what are seen as educational frills, many of which parents do not support. Inherent in this approach is the idea that intellectual objectives are the primary goal of fundamental approaches to the exclusion of development of students in physical, social, emotional and aesthetic areas. In addition, conservative, hard-line discipline and patriotism are seen as basic to the education and socialization functions of the school system and necessary to provide an atmosphere conducive to learning. Advocates of the fundamental schools are generally teachers, parents and school board members who see the basic school empowering parents and minimizing power of professional groups (Mason, 1990; Petchel, 1983; Jennings, 1983).

Opponents of the fundamental school approach point to numerous problems with the philosophy and approach. A primary concern is that strictly limiting the curriculum to the basics deprives students of a broad education and exposure to a wide range of ideas and skills that may be

necessary for functioning and survival in the 21st century. Some concern has been expressed that the de-emphasis on such topics as literature, art, music, psychology and sociology overlay an agenda to prevent critical examination of values, organizations and behaviors. In this respect, the back to basics movement has been described as a "distortion...used as a smokescreen to hide censorial intent" (O'Bryan-Garland & Parkay, 1985, pg 30).

The emphasis on basic skills is often criticized as an emphasis on basic *sub*-skills which sacrifices understanding of important concepts, say in mathematics, for intensive drill in computation (O'Bryan-Garland & Parkay, 1985; Ellis, 1975). This emphasis on basics has arguably undermined higher order thinking and problem solving skills and analytical abilities (O'Bryan-Garland and Parkay, 1985). A study by Taylor and Birchell (1983) proposed that the back to basics movement exerted noticeable influence on the type of text being produced for elementary school social studies classes. The study compared texts produced in 1979-1982 time frame with those produced in the 1969-1972 time frame and found an increased emphasis on reading skill development as an important function of social studies, American history and geography, citizenship, traditional American values and teaching and testing of factual recall. In addition, they found a decreased emphasis in innovative teaching suggestions, use of simpler vocabulary, shorter sentences and presentation of fewer concepts. The authors attributed this to the back to basics movement, but recognized the additional influences of societal changes such as the women's and minority movements and improved technology. The National Assessment of Educational Progress (NAEP) blamed the decline in mathematics skills seen in the 1970's partly on the back to basics movement (Education Commission of the States, 1979).

Opponents also express misgivings about the emphasis on discipline and see it as restrictive and even oppressive. One study of basic schools (Weber, McBee, Burton & Wildman, 1985) demonstrated a "dearth" of student/student interactions and found that students in these schools tended to interact primarily with teachers. Those interactions were almost always teacher initiated. The authors expressed concern that valuable interactions between student and teacher could be lost and replaced with teacher dominated classrooms that can be counterproductive. A study of Mennonite schools by Dewalt and Troxell (1989) found them to be similar in someways to fundamental schools. Emphasis was on reading, math, penmanship and independence and the child was responsible for learning. Work habits were emphasized and students became diligent and automatic in this respect with minimal teacher time spent in praising or criticizing but with nearly 5% of time spent in giving students directions. These schools never had a discussion and the primary emphasis was on teachers presenting lectures and students responding with questions, recitations or reading aloud. Caution must be exercised, however, in extrapolating research results

or making inferences from studies of a unique sub-culture to the overall American public school student. In addition, it is important to remember that Mennonite schools are organized around principles of their religion which are consistently reinforced at home and within the sub-cultural group.

Rosenholtz and Cohen observe that the back to basics classroom is popular with parents and teachers because it has intuitive appeal to adult nostalgia, the teaching is in the style that teachers themselves prefer and the strict control minimizes overt interracial conflict in desegregated classrooms. These researchers propose, however that the emphasis on drill, recitation, testing and seatwork, the narrow curriculum, and the use of competitive norm-referenced testing and grading focuses only on one dimension of intelligence. This places the minority child at an academic disadvantage and reinforces racist stereotypes about intellectual ability of minority children and may cause re-segregation.

In this respect, Rosenholtz and Cohen (1983) propose that reading ability functions as a status characteristic for school children and others who fail to comprehend that intelligence is a multidimensional construct wherein abilities are not necessarily correlated (Anastasi, 1988; Sternberg, 1977; Guilford, 1967). When intelligence is seen as unidimensional, reading skills become an easy barometer for students of how smart one is expected to be on a wide variety of tasks. In the Rosenholtz study, even on a task requiring no reading skill, students with obvious reading ability were judged more capable by all students. Those students who expect to be smarter will be more instrumental in a wider variety of classroom tasks than those who expect to be less smart. When reading skill is the single criterion for intelligence and effort, Rosenholtz proposes that, "...it is difficult to conceive of students who are almost illiterate as having logical, creative minds, as being quite capable of making important intellectual contributions to a group discussion or to the solving of a scientific problem" (pg 516). The end result of this process is that minority children, the ones often most likely to experience reading problems, will be accorded low status and perceived as having little intellectual ability. Identified in these ways, these students may be less likely to engage in challenging tasks or participate scholastically in meaningful ways and may become re-segregated into low ability groups and classes. In addition, negative racial stereotypes are reinforced for the student who perceives intelligence as unidimensional and minority children as having lower intellectual ability. This stereotyping has broader implications than just in the classroom. The Rosenholtz group found that classroom performance was also a major basis for selection of friendship groups.

Student Achievement. Empirical research into the academic effects of fundamental schools is extremely limited. Predictably, publications in this area are concentrated in a volley of passionate think-pieces fired in a war of words. In one empirical study of academic effects, Weber and his associate (1985) compared fourth and sixth graders from each of three fundamental schools with equal numbers from three regular elementary school located in a metropolitan area, controlling for socioeconomics and size. They examined student achievement, self-concept and behavioral climate.

To examine achievement they used stanines from the SRA achievement tests, controlling for scholastic aptitude. Manovas on the fourth grade stanine scores demonstrated the fundamental schools to be significantly higher on math, reading, science and language but not different on social studies. Manovas on sixth grade scores demonstrated no significant differences. Analysis of gain scores from fourth to sixth grades demonstrated significant gains for fundamental schools in math, while gains for the regular schools were significant in language, math, science and composite scores. Examining the results of these two sets of analyses, it appears that students in the fundamental schools enjoyed a significant advantage at grade four and mean math scores for these students increased between grades four and six. During this same time period, students at the regular school closed the gap with larger gain scores, essentially washing out the grade four advantage of the fundamental school students. Use of stanine scores here, however, is troubling since this particular standard score contains more statistical noise than other available units of measurement. Use of NCE scores, for example, would have been more stable.

To evaluate self-concept, the Weber group used a 29 item self-rating scale (Bledsoe & Garrison's Self-concept Scale) and found no differences between the two types of schools. School climate was assessed using visiting evaluation teams who rated such things as learning climate, student-teacher and student-student relationships and conduct about the building and grounds. Fundamental schools were significantly higher on items relating to learning climate, student-teacher interactions and conduct about the building.

In addition to the ratings by the observation team, teachers in each school were given an 11 item survey rating behaviors such as deportment, student-teacher relationships and support from parents. The teachers in the fundamental schools rated their students significantly higher on most items. The study made no attempt to examine attitudes toward school and learning, attitudes of students toward peers, creative thinking, problem-solving or attitudes and abilities in the arts. As a result, the study design examined areas emphasized by fundamental schools, possibly biasing the results somewhat in their favor.

A study conducted in 1979 by Brandt compared Mesa, Arizona's fundamental school with three other comparison schools matched on such things as academic achievement, size, ability, demographic characteristics and school architecture. The dependent variables in this study were district criterion referenced tests on math, reading and written communications and the STEP (Sequential Tests of Educational Progress). There were no significant differences on pre-test scores or ability tests although there was a significant difference in the average score for number of objectives correct with comparison students outpacing fundamental school students.

On post-testing, comparison school students were significantly higher on the percent achieving mastery and on the number of objectives mastered. No differences were found in the amount of instructional time although more time was spent in the fundamental school on non-academic tasks such as transitions or disciplining. The Minnesota Teacher Attitude Inventory (MTAI) described the comparison school teachers as more affectionate and less dominant than those at the fundamental school. Surveys revealed that parents at the fundamental school reported less TV time watched by their students than parents at comparison schools and both parents and students at the fundamental school reported more positive feelings about the school then did those from the comparison schools. Attitudes toward discipline did not differ among schools. Results from the STEP administered to all 6th grade students demonstrated significantly higher scores on all subjects for the comparison students than for Fundamental students. This difference remained significant when three other schools, selected by the fundamental school's principal, were compared.

There are several problems with this study. At the time the study was conducted, the fundamental school had been operational only one year and represented only a small (approximately 2.2%) percentage of elementary school students in the district. Sixth graders who were tested had attended the basic school for one year only and had attended other district or non-district schools for the previous years, creating substantial research "noise". The school itself was in a period of transition, having not yet established lasting routines. Substantial backing and filling occurs with the opening of any school, particularly one that adheres to a differing philosophy. The STEP results here are substantially contaminated by input from so many variables that, in reality, the consistent differences across six schools probably remains an enigma.

MESA PUBLIC SCHOOLS
FUNDAMENTAL SCHOOL

Program Description. In the mid 70's a group dissatisfied with the educational approaches available in their neighborhood schools and calling itself People for Basic Education approached the school board of Mesa Public Schools about establishing a fundamental school within the district. After several years of discussion and planning, parents and school staff began to develop proposals for that school in early 1978. They defined desirable characteristics of the fundamental school as homework, grades, self-contained classrooms, dress and grooming codes, discipline, and parent involvement (McGowan, 1979). A long-established unit within the district, was being phased out and the Board was convinced to convert it into a fundamental school, loosely based on the Pasadena model. The school (hereafter called "Fundamental") began operation as such in August 1978, with 347 students and by September 29, had 370 students which was approximately where enrollment stabilized. Fundamental was subsequently expanded in 1982 and in 1983 with a current enrollment of approximately 800 students.

The philosophy of the fundamental school is to

> "train the intellect, teach skills, instill a sense of pride in and respect for self, others and country, motivate students to strive toward standards of excellence in all fields of endeavor, equip students with the necessary skills to become decision makers and problem solvers and prepare students for the world outside by challenging them to compete for achievement of standards in the classroom" (Franklin, 1990).

Students are enrolled on a first-come, first-served basis and they must provide their own transportation to the Fundamental school. The exception to this is that students who have siblings attending are given preference at enrollment. The school usually has a waiting list and several approaches have been tried to minimize difficulty and make enrollment fair. Parental input is an essential element of the school with all parents encouraged to attend an initial orientation meeting. Those parents who do not attend must meet with the school principal for a personal orientation and children are not allowed to attend class until this is done. All parents are encouraged to serve on school committees for such things as various events, curriculum design, library selections and textbook selections.

The fundamental school has a list of 19 school rules which are rigidly enforced ranging in content from talking quietly on campus using "wholesome and courteous language" to where students may ride bicycles. Discipline procedures are broken into eight levels from a warning (level 1) to a long-

term suspension (level 8). A dress code specifies long pants and shirts with sleeves for boys and long pants, skirts and blouses or dresses of at least knee length and which cover the shoulders for girls. Disruptive writing and/or pictures on clothing is forbidden. Band, chorus, orchestra and a sports program are taught before and after school, but are not part of the regular curriculum to prevent students being pulled from regular classes. There are no accelerated learning or English as a second language programs at the school. A resource teacher works with certain learning disabled students and serves as a consultant to teachers and a part-time instructor is provided for students with speech difficulties.

The traditional curriculum is taught including reading, phonics, handwriting, math and English. Social studies are limited to history, geography and age appropriate current events. Art emphasizes traditional approaches. Recitations of memorized works are required of all students and citizenship is taught emphasizing courtesy, respect and honesty. Field trips are minimized.

Homework is assigned 4 nights per week with minimum and maximum times prescribed. For example, a first grade student is recommended to have a minimum of 15 minutes and a maximum of 30 minutes daily while a sixth grade student can expect a minimum of 30 minutes and a maximum of 90 minutes of homework. Work not finished in school or left over from a prior evening is additional. Homework is the responsibility of the student and parents are discouraged from helping students, but are responsible for providing a place to study and examining and signing homework. Grading follows a strict criterion pattern with 94% the minimum for an "A", 86% for a "B", 77% for a "C", and 69% for a "D". Report cards are issued every six weeks.

Student Characteristics. The administrator at Fundamental describes students as stable, generally lower-income families in which the father is employed and the mother is a homemaker. Most own their own homes and there is a low mobility rate. A high proportion of students may be eligible for free or reduced lunch, but families have expressed feelings of concern at taking a subsidy to help with their "responsibility" to the principal and the school nurse. Because of this the principal believes the actual percentage of students eligible for free and reduced lunch is probably 6-8% higher than those actually receiving these benefits. (Mason, 1990, McCowan, 1989). As of January 1991, Fundamental had 15.4% on this program while the district average was 29%.

Currently, minority students are present at Fundamental (7%), but underrepresented compared to district figures (18%). The vast majority of students at the school are white, living with 2 parents who speak English primarily in a single family home. When we examine the distances that

students travel to attend Fundamental school, we find that 41.4% of students travel 2 miles or less which is remarkable when we consider that the school is surrounded by an area with a high concentration of business and industrial zoning. In many ways, this makes Fundamental a neighborhood school with a number of students being transported in by their parents.

A large number (estimated by the administrator at 60-65%) of students are believed to be members of the Church of Jesus Christ of Latter-day Saints (LDS), but the district keeps no record of religion so all we have are estimates. There are also strong contingents of Roman Catholics, Baptists and other fundamental Christian groups (Jennings, 1983). Whatever church families belong to, they tend to be very active in church affairs. The administrator at Fundamental observed that often families cannot afford parochial schools so they send their children to Fundamental which they see approaching the parochial concept (Mason, 1990).

Parents are described as having qualities of independence and self-reliance. They exhibit competitive attitudes in athletics, business and education and see education as critical to their child's future success. Many are people who have started their own business and they tend to believe that if it's going to get done, they will have to do it. These parents also tend to be vocal activists with little regard for public opinion (Mason, 1990; Snow, 1978).

Students are described as adopting many of the attitudes and values of their parents. Several incidents have occurred wherein High School students returned property or money to pay for property stolen from the school during their time there. Most students personally returned the goods with an apology although occasionally there is an anonymous return (Mason,1990).

METHODOLOGY

Research Questions. During the 1989-90 school year, the first group of students to have completed all six years at Fundamental graduated from high school and three additional groups of students who had attended 6 years had completed junior high school. This enabled us to examine long-term effects of a fundamental elementary school education. We designed a longitudinal study

to examine characteristics of the students and to assess academic achievement as measured by standardized testing and social interactions as measured by high school extra-curricular activities. We addressed the following research questions:

Do students who attend a fundamental school throughout grades 1-6:

1. differ in demographics such as family descriptions, attendance and ability from students in comparative schools?

2. score higher on standardized tests than do students in comparative schools?

3. take more advanced placement courses than do students in comparative schools?

4. achieve more academic honors or leadership positions or participate in activities more than do students in comparative schools?

5. exhibit different dropout and withdrawal patterns than do students in comparative schools?

6. exhibit different absence rates than do students in comparative schools?

Subjects. Subjects were selected from Fundamental and from 2 other district schools (C-1 and C-2) for comparisons on selected measures of student achievement and participation. The 3 schools were matched on a standardized score based on socioeconomic factors such as Otis-Lennon SAI (Scholastic Ability Index) scores, free and reduced lunch, single parent homes and mobility. Since there was some belief that Fundamental had a high number of LDS students, one comparative school (C-1) was selected from an area also believed to have high representations of LDS students. All students enrolling in the first grades of Fundamental and the 2 comparative schools during the first 4 years Fundamental was operational (1979-1981) were identified and students who had remained within each school for grades 1-6 were selected for further evaluation. Attendance patterns for these students were then examined to determine which students had continued to attend Mesa Public Schools consistently from grade 6 to graduation or through the last school year. Any student who did not attend a district school for all years was eliminated from the study. If a student had skipped a grade, the student was included in the sample. This gave us a population of students who had attended either Fundamental or a comparative school consistently throughout their elementary school years and had remained within the district for the rest of their academic careers. The first group to enroll at Fundamental had graduated, the second group to enroll were currently Seniors, the third group Juniors and the fourth Sophomores. All students

had completed ninth grade. A total of 420 students were included in the final sample: Fundamental had 70 students, C-1 had 192 and C-1 had 158. The final sample breakdown by year and by school can be seen in Table 1.

TABLE 1
SAMPLE DISTRIBUTION

	First Grade Entry Year				
SCHOOL	78-79	79-80	80-81	82-81	TOTAL
Fundamental	11	15	23	21	70
C-1	35	57	47	53	192
C-2	35	31	33	59	158
Total	81	103	103	133	420

Data Collection. To determine a profile of students from each school, longitudinal demographic data for the sample were collected on each school including information on ethnicity, primary language, type dwelling and parental structure pattern. These profiles can be seen in Table 2. Overall, Fundamental seems to fall between the other two schools. Comparison school C-2 is more like Fundamental than is C-1, but differences among the schools are small. Except for 1981-82, Fundamental school had more minorities than C-1 but approximately the same percentage as C-2. While the percentages of minority students at the other schools has remained fairly stable, minorities at Fundamental have steadily decreased. Fundamental had a larger percentage of Native American students than either of the comparable schools but fewer Asian/Pacific Island students. The percentage of students with English as the primary language in these schools remained quite stable over the 4 years with the exception of C-2 which declined approximately 3%. Single family homes increased, except for C-2 which again decreased. The number of 2-parent families increased across all schools.

Data on achievement, advanced placements, graduation rates, attendance and withdrawal were collected from District student records and information on extra-curricular activities was obtained

from high school yearbooks published within the District. Yearbook indexes were used to locate individual student information and this was then classified according to the following criteria:

> LEADERSHIP: an activity requiring use of organizational, motivational, decision-making and/or management skills whether elected or appointed: e.g. elected to student government office such as class officer or student council member or head of a unit such as football captain or club president

> PARTICIPATION: inclusion in a unit in which activities are primarily membership, supportive or honorary in nature whether elected or appointed: e.g. member of unit such as Pom-pom line, football team or school club, elected in "popularity" type contest with limited responsibility such as homecoming queen or given an award not primarily scholastic related such as school spirit or best attendance

> ACHIEVEMENT: outstanding personal performance in activities primarily cognitive or a combination of cognitive and psychomotor in nature: e.g. national merit scholar, award for outstanding art/science/home economics student

> IF a student met criteria for more than one category (e.g. student council member (leadership) who is given award as outstanding student council member (participation)) then student was counted in both areas (e.g. leadership and participation).

To evaluate ability levels across schools, analysis of variance was conducted on Otis-Lennon SAI scores. Means and standard deviations can be seen in Table 3. Significant differences ($F_{2,402}$ =3.73, MS= 194.4) were found only between Fundamental and C-1.

Table 2

School Profiles: Ethnicity, Language, Dwelling and Parents

	Ethnicity						Two Parents	Dwelling: Single Family	Primary Language: English
Fundamental	Students	White	Black	Hispanic	Amer Ind	Asian			
1981-82	426	401 (94.6%)	1 (.2%)	14 (3.3%)	7 (1.7%)	1 (.2%)	397 (93.2%)	401 (94.6%)	423 (99.3%)
1980-81	410	377 (92.4)	1 (.2)	18 (4.4)	11 (2.7)	1 (.2)	376 (91.7)	384 (94.1)	405 (98.8)
1979-80	402	368 (91.8)	2 (.5)	22 (5.5)	7 (1.7)	2 (.5)	369 (91.8)	373 (93.7)	398 (99.0)
1978-79	371	332 (90.0)	2 (.5)	26 (7.0)	5 (1.4)	4 (1.1)	319 (86.0)	323 (88.3)	371 (100.0)
C-1									
1981-82	717	692 (96.6%)	0 (0%)	13 (1.8%)	6 (.8%)	5 (.7%)	678 (94.6%)	683 (96.7%)	711 (99.2%)
1980-81	721	698 (97.1)	0 (0%)	14 (1.9)	3 (.4)	4 (.6)	690 (95.7)	683 (96.1)	717 (99.4)
1979-80	781	756 (96.9)	0 (0%)	16 (2.1)	4 (.5)	4 (.5)	724 (92.7)	666 (86.5)	780 (99.9)
1978-79	761	722 (95.1)	2 (.3)	22 (2.9)	5 (.7)	8 (1.1)	663 (87.1)	655 (86.5)	761 (100.0)
C-2									
1981-82	997	914 (91.7%)	17 (1.7%)	30 (3.0%)	4 (.4%)	32 (3.2%)	899 (90.2%)	902 (93.3%)	907 (97.4%)
1980-81	1021	935 (91.7)	26 (2.5)	31 (3.0)	4 (.4)	24 (2.4)	945 (92.6)	976 (97.5)	992 (97.2)
1979-80	1012	926 (91.9)	24 (2.4)	32 (3.2)	4 (.4)	22 (2.2)	915 (90.4)	979 (97.7)	981 (96.9)
1978-79	866	788 (91.3)	23 (2.7)	33 (3.8)	5 (.6)	14 (1.6)	746 (86.1)	843 (98.0)	866 (100.0)

Table 3
Means and Standard Deviations
for Otis-Lennon SAI Scores

School	N=405	Mean/S.D.
Fundamental	n=68	115.07 (14.13)
C-1	n=188	109.68 (13.52)
C-2	n=149	111.07 (14.38)

Design. Using SAI scores as a covariate, analyses were conducted in a single factor (school) design on measures of achievement at grades 6, 9 and 11. College entrance exams, number of advanced placement classes taken in high school, numbers of extra-curricular school activities, class standing and student absences were also used as dependent variables. All analyses were tested at alpha = .05.

RESULTS

Student Achievement: Grade 6. Adjusted means for analysis of Grade 6 standardized test scores can be seen in Table 4.

Table 4
Grade 6: Adjusted Means and Standard Deviations
for Standardized Tests**

TEST: (First Grade Year)	Fundamental	C-1	C-2
CAT: (1978)			
Reading (F=1=2)	68.91 (17.16)	62.50 (15.98)	63.57(20.59)
Language (F=1=2)	82.91 (12.37)	74.64 (16.73)	74.83(16.84)
*Math (F>1=2)	89.91 (11.42)	68.42 (16.89)	76.70(14.63)
ITBS-Old: (1979)			
Reading (F=1=2)	65.64 (14.13)	58.68 (14.06)	62.31(20.16)
Language (F=1=2)	70.86 (14.37)	61.37 (12.96)	61.80(13.86)
Work Study (F=1=2)	65.36 (13.20)	59.22 (13.90)	60.55(19.72)
*Math (F>1=2)	81.00 (12.47)	61.89 (13.22)	63.90(20.24)
ITBS-New: (1980,1981)			
Reading (F=1=2)	67.56 (12.93)	59.99 (16.55)	63.61 17.03)
*Language (F>1=2)	77.44 (14.47)	65.76 (15.10)	69.71(16.22)
*Work Study (F>2>1)	71.14 (13.48)	60.62 (16.30)	65.88(15.06)
*Math (F>1=2)	81.35 (15.30)	66.32 (17.66)	70.59(18.88)

*Significant differences among schools (rank order)
**Tests:
CAT: California Achievement Tests: administered to grade 6 in 1984.
ITBS-O: Iowa Test of Basic Skills, old norms: administered to grade 6 in 1985.
ITBS-N: Iowa Test of Basic Skills, new norms: administered to grade 6 in 1986-87.

BEST COPY AVAILABLE

The following significant differences were found: CAT Math test given to students who entered first grade in 1978 ($F_{1,68}$ = 14.64 MS= 164.69), rank order Fundamental > C1=C2; ITBS math (old norms) given to students who entered first grade in 1979 ($F_{1,93}$ = 13.86 MS= 154.13), rank order Fundamental > C1=C2; ITBS (new norms) given to students who entered the first grade in 1980 and 1981 on Language ($F_{1,225}$ = 8.64 MS= 168.03), rank order Fundamental >C1=C2; Work Study ($F_{1,225}$ = 4.55 MS= 161.05) rank order Fundamental > C2 > C1; and Math ($F_{1,224}$ = 13.35 MS= 214.06) rank order Fundamental > C1=C2.

Student Achievement: Grade 9. Because norm differences between the Tests of Achievements and Proficiency (TAP) and the Stanford Achievement Test (Stanford) are minimal, we initially analyzed each test separately and then analyzed across tests for 9th grade students. Adjusted means for ninth grade standardized testing can be seen in Table 5. There were no significant differences among schools at grade 9.

Table 5
Grade 9: Adjusted Means and Standard Deviations for Standardized Tests*

TEST: (First Grade Year)	Fundamental	C-1	C-2
Stanford: ('78, '79)			
Reading (F=1=2)	69.35 (13.59)	66.56 (15.73)	65.67 (17.73)
Language (F=1=2)	63.65 (19.39)	63.19 (15.44)	62.16 (18.15)
Math (F=1=2)	73.04 (18.27)	70.04 (16.58)	69.30 (19.97)
TAP: ('80, '81)			
Reading (F=1=2)	70.19 (13.85)	68.13 (16.84)	67.39 (17.08)
Language (F=1=2)	71.21 (15.29)	64.67 (15.48)	65.18 (15.02)
Math (F=1=2)	68.84 (15.46)	64.62 (14.82)	64.71 (14.63)
Combined Stanford/TAP			
Reading (F=1=2)	69.89 (13.66)	67.43 (16.33)	66.71 (17.29)
Language (F=1=2)	68.58 (17.07)	64.00 (15.43)	63.99 (16.33)
Math (F=1=2)	70.30 (16.48)	67.07 (15.83)	66.51 (17.01)

*Tests:
Stanford: Stanford Achievement Test: given 9th grade: '87, '88.
TAP: Tests of Achievement and Proficiency: given 9th grade: '89, '90.

Student Achievement: Grade 11. Only the first group of students entering school in 1978 had taken the 11th grade TAP. Means for this test can be seen in Table 6. Manova did not demonstrate any differences among schools. However, it should be noted that in examining individual scores for the 11th grade TAP, we found test scores to be inconsistent with SAI scores, supporting the suspicion that 11th grade students take testing less than seriously. Scores in this grade should be evaluated in light of this pattern.

Since differences were found at grade 6 but not at either grade 9 or 11, we wanted to determine the directions of change across grades. These changes can be a function of any one of 5 possible patterns:

1. Fundamental school scores decrease and comparable school scores remain stable.
2. Fundamental school scores remain stable and comparable school scores increase.
3. Fundamental school scores decrease and comparable school scores increase.
4. Both fundamental and comparable school scores decrease with fundamental schools decreasing more.
5. Both fundamental and comparable school scores increase with comparable school scores increasing more.

The problem with this determination is that we are dealing with different tests and with multiple norms within tests rendering determination of equivalency impossible. Testing patterns, however, were identical across schools. That is, if students from Fundamental took test X in 6th grade, students from the comparable schools also took test X in 6th grade. What we need then, to evaluate directions of change, is some index of motion from test to test within schools. To create this index, we averaged test means across all possible grade combinations, creating a comparative directional index we will call Type D scores. Means can be seen it Table 6.

Table 6
Means and Standard Deviations from Sixth to Eleventh Grades by School across Standardized Tests

Grade	Fundamental	C-1	C-2
6th Grade	Mean (SD)		
Reading	67.37 (1.34)	60.39 (1.58)	63.16 (0.06)
Language	77.07 (4.91)	67.26 (5.52)	68.81 (5.32)
Math	84.09 (4.12)	65.54 (2.72)	70.40 (5.23)
9th Grade			
Reading	69.89 (13.66)	67.43 (16.33)	66.71 (17.29)
Language	68.58 (17.07)	64.00 (15.43)	63.99 (6.33)
Math	70.30 (16.48)	67.07 (15.83)	66.51 (17.01)
11th Grade			
Reading	66.00 (18.87)	58.60 (14.24)	56.00 (18.56)
Language	65.09 (14.89)	61.67 (16.62)	60.64 (16.00)
Math	67.82 (18.02)	60.67 (16.66)	62.68 (20.41)

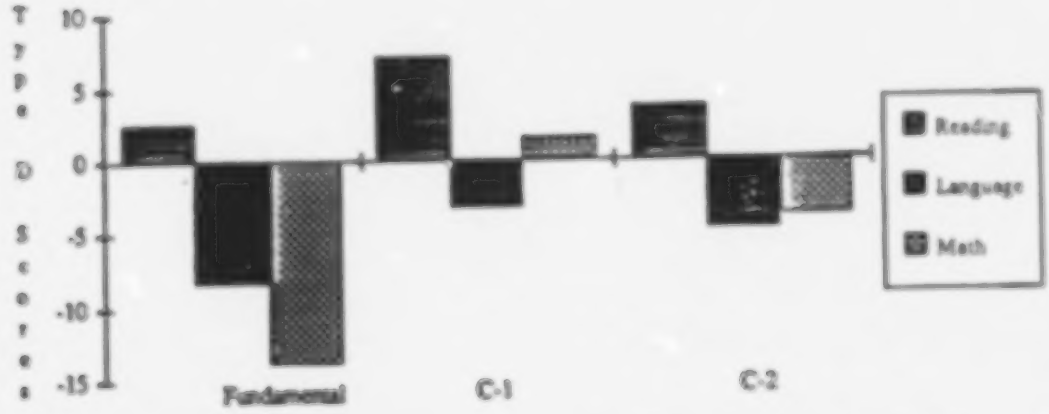
	Type D Scores		
Subject	Increase (Decrease)		
Grade 6 to Grade 9:			
Reading	2.52	7.04	3.55
Language	(8.49)	(3.26)	(4.82)
Math	(13.79)	1.53	(3.89)
Grade 6 to Grade 11:			
Reading	(1.37)	(1.79)	(7.16)
Language	(11.98)	(5.59)	(8.17)
Math	(16.27)	(4.87)	(7.72)
Grade 9 to Grade 11:			
Reading	(3.89)	(8.83)	(10.71)
Language	(3.49)	(2.33)	(3.35)
Math	(2.48)	(6.40)	(3.83)

These Type D scores are an index of directional changes in mean scores across non-comparable test norms which can be used to determine which of the 5 possible change patterns resulted in comparable test scores at grades 9 and 11. A word of caution to the reader: Because we are examining tests with markedly different norms without the ability to standardize them, making the two sets of test equivalent, negative directional changes should not be interpreted as a "loss" or "failure to gain" from 6th to 9th grade, but rather as comparative directional changes in scores with differing means. This allows us to examine changes between these grades across schools but under no circumstances should Type D scores be used as an achievement indicator.

Score Changes Grade 6 to Grade 9. As we look at these change scores from grade 6 to grade 9, (Figure 1) it is apparent that negative directional changes occurred frequently. The lack of significant differences among schools at grade 9 appears to be a function of scores for Fundamental school students changing in the direction of the comparative schools while these remain relatively stable or move in a counter direction, rendering them not significantly different at grade 9.

Figure 1

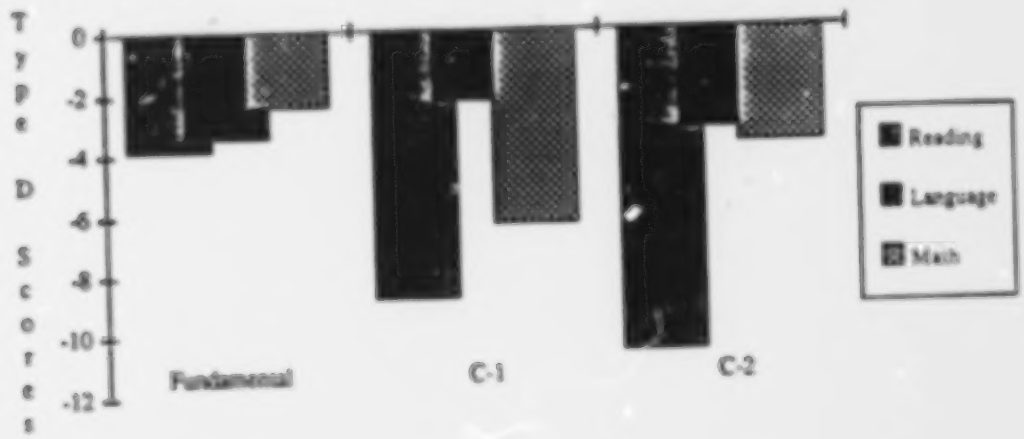
Comparative Directional Changes in Test Scores: Grade 6 to Grade 9



Type D Scores: A directional index created by averaging mean scores within each school and within content areas, allowing comparisons of changes in direction between two tests with non-comparable norms. These scores were created by subtracting grade 6 mean scores from grade 9 mean scores within content areas and schools.

Score Changes Grade 9 to Grade 11. Further examining these changes, we plotted score changes from grade 9 to grade 11 (Figure 2). During this time span, the students from Fundamental remain fairly stable with the scores from comparison schools showing more negative directional change. It should be noted that during this time frame, all schools and all scores moved in the same direction with Fundamental showing least overall change.

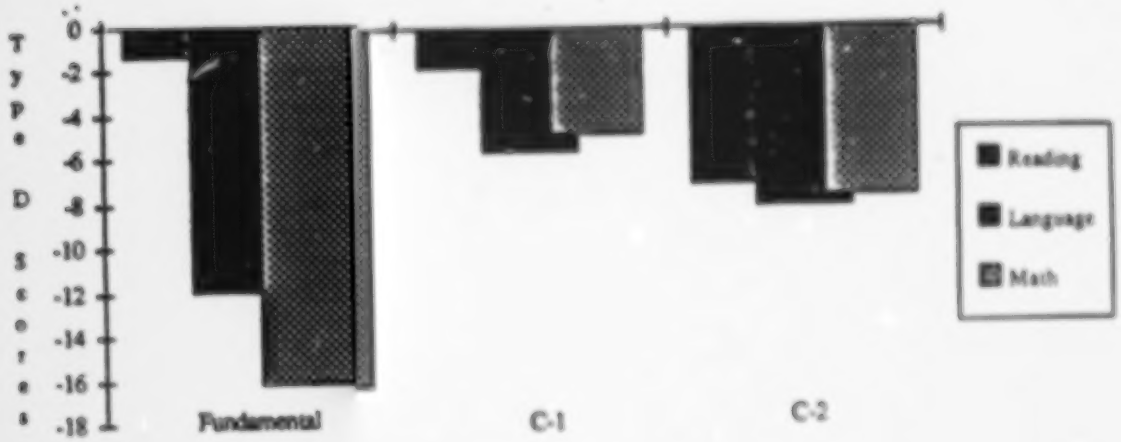
Figure 2
Comparative Directional Changes in Test Scores: Grade 9 to Grade 11



Score Changes Grade 6 to Grade 11. When we plotted longitudinal score changes from grade 6 to grade 11 (Figure 3), we again see that all schools in all subjects move in the same direction, with Fundamental students demonstrating the most negative directional change over that time period and C-1 the least.

It is obvious in examining Figures 1 through 3 that the reason significant differences are not seen at grade 9 and grade 11 is that scores from Fundamental have moved to become more like those of the comparative school. The bulk of this change occurs in grades 6 through 9 for Fundamental.

Figure 3
Comparative Directional Changes in Test Scores: Grade 6 to Grade 11



Student Achievement: ACT/SAT Exams. Ancova were conducted on student scores from the common college entrance exams American College Testing Exam (ACT) and the Scholastic Aptitude Test (SAT). Most students take these exams in their junior or senior year, so approximately half of our sample had reached the point we would expect to find test scores. Any subject with a recorded exam score was included in these analyses regardless of grade and if a student had taken the exam more than once, the most recent score was used. Adjusted means for these analyses can be seen in Table 7. There were no significant differences among schools on these scores.

Caution should be exercised here, however, since very small numbers of students are involved: only 4 students from Fundamental took the SAT and only 5 from school C-2 took the ACT. Possibly a better indicator of what is happening with these exams is the percent of students from each school taking the exam. A higher percentage (11.6%) of Fundamental students takes the ACT

while only a very small percentage (5.8%) sit for the SAT, a definite preference for the ACT. We see the reverse with C-2: only a small number (3.2%) sit for the ACT while a larger percentage sit for the SAT (9.6%). With C-1 we have the larger percentage (15.1%) sitting for the ACT, but a moderate percentage (7.3%) sitting for the SAT.

Table 7
Adjusted Means, Standard Deviations and Percent of Students Sitting for ACT and SAT Exams

TEST	Fundamental			C-1			C-2		
	Mean/S. D.	n	% Sample	Mean/S. D.	n	% Sample	Mean/S. D.	n	% Sample
ACT									
English	26.38 (5.48)	8	11.6	22.48 (5.41)	29	15.1	28.60 (4.45)	5	3.2
Math	25.38 (5.63)	8	11.6	21.97 (4.87)	29	15.1	27.80 (6.94)	5	3.2
Comp.	24.38 (4.03)	8	11.6	23.07 (4.61)	29	15.1	29.00 (4.85)	5	3.2
SAT									
Verbal	565.0 (88.9)	4	5.8	479.3(110.9)	14	7.3	410.7(89.87)	15	9.6
Math	630.0 (56.0)	4	5.8	528.6(120.4)	14	7.3	518.7(118.0)	15	9.6

Other Student Activities. In addition to examining test scores, we analyzed data on other related student activities (Table 8). We found no significant differences among schools on total absences during high school years, number of advance placement classes taken or academic honors awarded to students. We found significant differences on class standing ($F_{1,72}$ = 4.77 MS = 45.64), leadership activities ($F_{1,264}$ = 4.09 MS = .03) and participation in extra-curricular activities ($F_{1,264}$ = 15.41 MS = 2.34). Rank orders on each of these variables was Fundamental > C-1=C-2.

Table 8
Means and Standard Deviations for Selected Student Activities

ACTIVITY	Fundamental		C-1		C-2	
	Mean/S. D.	n	Mean/S. D.	n	Mean/S. D.	n
Sum of absences (grade. 9-12)	11.27 (11.71)	69	10.85(9.4)	192	11.26 (12.1)	157
Advance placement Classes	2.32 (4.03)	68	1.03 (2.7)	188	1.49 (3.3)	149
Class standing* (F>1=2)	176.36 (108.13)	11	308.=(190.0)	34	310.13 (203.0)	30
Leadership* (F>1=2)	.073 (.264)	41	.008 (.09)	131	.027 (.21)	95
Participation* (F>1=2)	2.05 (1.55)	41	1.14 (1.5)	131	.916 (1.5)	95
Academic	.098 (.374)	41	.046 (.24)	131	.042 (.20)	95

*Significant difference (rank order)

Withdrawal Patterns. Withdrawals by school are seen in Table 9. This sample size is larger than our ultimate sample because these withdrawals are for all students entering first grade over the four year period of our study. To obtain our sample, these students were tracked from entry through the 1989-90 school year. When they disappeared from the district records, we recorded the reason for withdrawal for as many students as possible.

For the first six years, these students were matched to their entry school to ensure that they had obtained all six years at the target schools. In grades one through six, students failed to match their target schools for two reasons: 1) they transferred out of the district or 2) they transferred within the district. If they transferred out of the district, we again tried to determine the reason for withdrawal. The process of transferring within the district presented more difficulty. As a student transfers from one school to another within the district, a "W7" is recorded on the student record. When they arrive at the new school, this "W7" is replaced by a reentry code, "R7". Therefore, students we were tracking in grades one through six could fail to match our target schools but have no withdrawal code recorded. We suspect that many of the students classified in Table 8 as "no

match" are probably transfers within the district. After grade six this was no longer a problem as we tracked these students throughout the district regardless of school.

In Table 9 we can see that percentage wise fewer Fundamental school students withdraw to go to public school but more withdraw to be taught at home and at non-public schools when compared to the other schools. Again, however, we must caution the reader we are dealing with very small numbers here and generalizations should be made carefully. The Fundamental school had no students drop due to unexcused absences and no dropouts for academic, personal or financial reasons. The total number of withdrawals for all schools was similar, but Fundamental had a somewhat higher number of "no match" students which, as we have indicated, may represent transferrals to other schools within the district, particularly at the elementary level. Overall, Fundamental had a slightly higher percent of students exit than did the comparison schools, mostly accounted for by the withdrawals to non-public or home schools or no matches.

Table 9
Withdrawals by Code

	Fundamental n=1609			C-1 n=2980			C-2 n=3896			Totals N=8485		
	#	% Enroll	% Drop	#	% Enroll	% Drop		% Enroll	% Drop	#	% Enroll	% Drop
Withdrawal Code												
W1: To Public School	4	.24	6.4	17	.57	14.5	29	.74	18.6	50	.59	14.9
W2: To Non-Pub. School	2	.12	1.7	1	.03	.9	2	.05	1.3	5	.06	1.5
W3: To Home	21	1.3	33.9	27	.91	23.1	44	1.1	28.2	92	1.1	27.5
W4: Unexc. Absence	0	0.0	0.0	2	.07	1.7	2	.05	1.3	4	.05	1.2
W5: Dropout/Academic	0	0.0	0.0	1	.03	.9	0	.00	.00	1	.01	.3
W6: Drop/pers or finan	0	0.0	0.0	3	.10	2.6	1	.02	.64	4	.05	1.2
W8: Early Graduate	0	0.0	0.0	1	.03	.9	0	--	--	1	.01	.3
W9: No Show	35	2.2	56.4	65	2.2	55.6	78	2.0	50.0	178	2.1	53.1
Total Withdrawals	62	3.8	100	117	3.7	100	156	4.0	100	335	3.9	100
No Match	102	6.3		128	4.3		162	4.2		392	4.6	
Total Exits	164	10.2		245	8.2		318	8.1		727	8.6	

BEST COPY AVAILABLE

DISCUSSION

Birthed in a storm of controversy, the district Fundamental school has reached adolescence. The first students who attended grades 1-6 within the fundamental school philosophy have now graduated from high school or are currently in high school enabling us to examine long-term effects of this approach to education.. We conducted a study of students who entered Fundamental first grade during the period 1978-1982, comparing them to students from two other schools with similar populations, examining student achievement, attendance, extra-curricular activities and patterns of withdrawals to determine what, if any, differences exist among schools. When we examined profiles of these students, those attending Fundamental had slightly higher ability levels than students attending the comparative schools, but overall demographics were quite similar. If segregation had occurred here as Rosenholtz and Cohen (1983) had suggested, it did not appear to be attributable to either the type of school or other school factors. All three schools have small minority populations with the exception of Asians at C-2, reflecting a smaller than usual number of minority students within the district. Type dwelling, English as primary language and proportion of two-parent families were similar across schools.

Student Achievement. We encountered some difficulties in examining student achievement since the type of standardized tests had changed several times during the period upon which we were focussing. We were therefore restricted to conducting analyses within each test. For sixth grade testing we had the California Achievement Test (CAT) and the Iowa Test of Basic Skills (ITBS) using two sets of norms. Had we been able to analyze across all these tests, the power of our analyses would have been increased considerably, but equating these norms was not possible.

At 6th grade we found significant differences between Fundamental and the comparative schools for the first two classes to enter Fundamental on math but not on reading, language or work study (CAT and ITBS/old norms). For the third and fourth classes to enter Fundamental, we found significant differences on tests of language, work study and math (ITBS/new norms) with the pattern of means showing Fundamental students' scores higher than either of the comparable schools. We see several possible reasons for the lack of consistency across all these tests. Differences in tests may somehow favor the Fundamental students in the ITBS with new norms, refining and fine tuning of Fundamental during the first few years of operation may have resulted in somewhat more advantage for later entering students or there may have been subtle changes in

the type of student attending Fundamental. The latter is certainly possible given the self-selection process that is operational at the Fundamental school, a process further restricted by preferential admission for siblings of students already in attendance.

Our results failed to support prior studies which found no differences in student achievement between fundamental and regular school students (Brandt, 1979). There is some support for the study by Weber and associates (1985) which demonstrated higher performance by fundamental school students in math scores at grade four. However, Weber found that these differences had washed out by grade six due to greater gains in the scores of regular school students.

As we examine grade nine testing, we have two tests, the Stanford Achievement Test and the Tests of Achievement and Proficiency, each of which was given for two years. In examining information on comparability of the norms of the two tests, we found them to be essentially equivalent and subsequently analyzed both tests separately and also across the two tests. In none of these analyses did we find any significant differences although means on all subtests were slightly higher for the students from Fundamental. In an effort to understand what had happened to move from significant differences to no differences, we created what we called Type D scores which allowed us to look at relative directional changes across non-comparable tests. These scores are not in any way indexes of achievement. Our findings indicated that negative relative directional changes were greater for Fundamental on language and math and that positive directional changes were greater for the comparable schools in reading. In other words, between these two tests, students from Fundamental performed more like students from the comparative schools on the ninth grade tests of language and math and students from the comparable schools performed more like Fundamental students on the reading scores. This pattern of initial advantage for Fundamental students in math with subsequent wash-out due to greater gains by regular students is again similar to that found by Weber (1985) except in our study it occurs later.

Analysis of the eleventh grade TAP indicated that there were again no significant differences. All schools exhibited negative relative directional changes from grade nine to twelve on all subtests with students from Fundamental changing the least. It appears that after the adjustment at grade nine, Fundamental student scores stabilized. Scores for students attending the regular schools were more stable between grade six and grade nine but then have more negative directional changes between grade nine and grade eleven.

From these test score patterns, it is apparent that rather interesting dynamics are occurring with students of both Fundamental and the comparative schools. Several questions arise: Why do

students in Fundamental score significantly higher on some sixth grade subtests but not other and why do these differences wash out by ninth grade? Answers to these questions can lie in the school, the test or the student or any combination of these variables.

While overall score patterns in our study were the same as those found by Weber and associates (1985), we found the score leveling to occur somewhat later. It is conceivable, given our design, that the leveling began earlier than grade six and simply continued through grade nine where we delineated it. Given Weber's results we have to consider the probability that the leveling of scores begins earlier than where we found it. If this is so, the differences in grade six scores would be smaller than differences earlier, say at grade four where Weber found them.

This pattern of initial superiority of the Fundamental school with subsequent over-taking by the regular school students is interesting in view of Piagetian developmental theory (Flavell, 1985). Piaget proposed a preoperational stage in the child's cognitive development from about age 4 to 7, which is dominated by intuitive thinking and an inability to focus on more than one dimension of a problem. Logical thinking does not begin to develop until about age 7 or 8. When we examine the Fundamental approach to the teaching of math we find emphasis on oral drill, written practice sheets and stress on memorization of math facts (Franklin, 1990). This approach seems in complete harmony with Piaget's developmental theories. Sorting, classifying and focussing on memorization of math facts does not require substantial logical thinking or multidimensional analyses. On the other hand, emphasis on problem solving and understanding of complex mathematical concepts may be operations for which the child prior to age 7 or 8 is ill prepared by development. If this is the case, the Fundamental approach may be a better match for the early cognitive abilities of the school child than is the regular curriculum. However, it appears from both our data and Webers that, regardless of approach, developmental and curricular issues eventually reconcile.

Another explanation of this shift phenomena lies in the direction of curricular matching. The fundamental or back to basics approach is just that: an emphasis on what most people consider to be the basic information that all students should learn with most of the frills eliminated. This is precisely the information that is weighted most heavily on standardized tests. Since standardized tests are given nationwide, it is impossible with our diverse culture and in a limited time frame, to test substantial amounts of enrichment information. Therefore standardized tests focus on basic information and skills acknowledged nationwide as important for students to learn: the basics. This superior match between standardized testing and Fundamental school curriculum could produce the significant differences in test scores which we found at grade six. It can also explain

the larger negative directional shift seeen in Fundamental students between grade six and nine. When Fundamental students are expoosed to a broader based curriculum, their scores more resemble those of other students.

This does not explain, however, why Fuundamental students the first two years score significantly higher only on the math subtest while laater students score higher on language and work study also. This could reflect a maturing process within Fundamental itself. The first two groups of students in our study entered first grade at Funddamental the first and second year of its existence. As we have proposed in regard to the Brandt study (1979), as a new school opens new processes are being implemented and routinized. Thhose that don't work are replaced or modified. In addition, the publicity and controversy surroundding the implementation of Fundamental could have been disruptive to some extent. By the time the third and fourth classes of students entered first grade, the 'bugs' had substantially been eliminnated and the school, teachers and students had established routines that enhanced student achievemment on the later test.

It should be observed, perhaps, that when we speak of Fundamental students performance being significantly higher than the comparativve schools, we are not indicating that the performance of the comparative schools was poor. Quite the contrary. We found the classic "Lake Wobegon Effect" in which the performance of all schools on all tests was generally well above the national average for such standardized tests. All three schools were, in reality, providing outstanding instruction to the students. When we speak of diffderences here, we are speaking in terms of "excellent" and "more excellent". Certainly no studennt in any of the schools we examined was being deprived of a quality education. What seemed appparent was that all of these children were probably being educated in environments of relatively equal quality but also ones that probably more precisely reflected the values of the parents and family.

When we examine these shifts betweeen sixth grade test results and ninth grade test results we find that Type D reading scores from all three schools maintained or increased but that language and particularly math scores of students from Fundamental shifted in a negative direction more than those of the comparative schools. This would indicate that while many of the same variables were effecting all students additional variables were effecting students from Fundamental. It seems reasonable that students from Fundamental face broader adjustment challenges upon entering junior high than do students from less structured schools. However, the discipline of the fundamental schools might be such that these studdents are able to police themselves better when it comes to a less-structured environment than are students from the comparable schools. It does not appear that this happens when we look at the relative directional shifts among these schools. Either this

discipline is not exercised at the junior high level or it is not enough to overcome other problems for the Fundamental schools students.

An additional explanation for this directional shift between grades six and nine might lie in the direction of metacognitive learning strategies used by students. Metacognitive or 'learning-how-to-learn' strategies are important parts of student knowledge bases. Students acquire learning strategies appropriate to the information they are expected to learn, their developmental stage and the learning environment to which they are exposed. An emphasis on basic education, discipline and memorization tasks may produce metacognitive skills that differ qualitatively from those acquired in an environment which emphasizes broad knowledge, problem solving, and critical thinking tasks. If this is the case, the metacognitive learning skills produced by the latter may prove more effective in a less restrictive, more ambiguous environment than do those of the Fundamental students.

It is interesting to note that the directional shift for Fundamental was greatest in math. This is generally seen as a subject demanding both substantial discipline to learn basic math facts well and recall them quickly and substantial analytical and problem-solving skills to select and use various applications. Recall for a moment that math was the only subtest at grade six in which Fundamental students consistently demonstrated significant differences from their comparative schools. In the early grades, the emphasis in mathematics is on learning and applying basic math facts and algorithms. An algorithmic task is one facilitated by discipline and memorization strategies and is particularly suited to Piaget's pre-operational stage seen from about ages 4 to 7. This type of task is presumably one at which Fundamental students would succeed and for which they would develop effective metacognitive strategies. Between grade six and nine, however, we see the greatest directional shift in this score. At junior high levels in the study of mathematics, there is increasing emphasis on the use of mathematics for problem solving and creative thinking demanding an heuristic set of metacognitive strategies. This use of heuristics would presumably be better matched to the strategies learned by students in the comparative schools and we would expect to see small if any directional shifts in their math subtest scores. If this matching of metacognitive strategies is operative, we would expect to see Fundamental students excelling in the early years and comparative school students excelling at the junior high years. This is exactly the pattern that our analyses delineate.

An area of concern in this regard is that of the less academically talented child. Recall that the average SAI in this study was approaching the first standard deviation above the mean. Approximately 84% of students have lower academic ability indexes than do the students in this

study. We must be concerned with the effect of these issues on the less gifted student. Specifically, will a student with less academic ability be able to overcome the leap from algorithmic strategies to heuristic strategies as readily as it appears that the students in our study are able to do?

There is one additional pattern that is of interest. Although Fundamental students have a marked negative directional shift at grade nine testing, this shift is not so evident at grade eleven testing. Overall, negative directional shifts for Fundamental students at eleventh grade approximate or are less than their counterparts in the comparable schools and the smallest shift here is seen in math subscores. Given our premise that the effectiveness of metacognitive strategies is evidenced by these testing patterns, it appears that between grades nine and eleven students from the fundamental school acquire the heuristic strategies of their peers in the comparison schools. The small number of students who have completed eleventh grade testing, however, indicates that conclusions at this grade should be drawn carefully.

College Entrance Exams. Only students who had entered Fundamental and the comparison schools in the first two years of operation had taken the usual college entrance exams. This produced a smaller number of students than are necessary for good inferential data analysis. Statistics here must be approached cautiously. It seems more helpful to examine patterns of test taking rather than statistical differences in tests. Test means for all schools were excellent on both the SAT and the ACT. On the ACT, the rank order of test means across all tests was C-2>F>C-1 and on the SAT the rank order of test score means across all tests was F>C-1>C-2. This positional shift is interesting in view of the numbers of students who took each test. For Fundamental and C-1, approximately one-half the tests taken were the SAT while for school C-2, three-quarters of the tests taken were the SAT. It is possible that for Fundamental and C-1, only the very top students took the SAT, scoring predictably high on it. For C-2, most of the students took the SAT which caused their mean to be somewhat lower.

This pattern is also interesting if we relate it to the types of schools which require each exam. The ACT is generally accepted by more universities in the western United States and by state institutions while the SAT is required by the more prestigious private institutions, universities in the eastern states and military academies. These schools are generally seen as academically challenging and difficult to enter. From our numbers, it would appear that larger proportions of students from C-2 were taking the test required for these more competitive schools while the students from Fundamental and C-1 were, for the most part, taking tests required by institutions closer to home. Recall that students from Fundamental and from C-1 were possibly more alike in the religious preference of their students (LDS) than was C-2. It is possible that these students are

more apt to attend western universities which are closer to home or to attend religiously affiliated schools located in the western United States than are student from C-2 which probably has a lower proportion of LDS students.

Class Standing. We found significant differences in the Fundamental and comparative schools on class standing. Based on grades and calculated relative to other students in the school and to school size, this is probably our most contaminated variable. Teacher grading procedures vary markedly from one teacher to another and among classes of varying difficulty. While advance placement or honors classes are more heavily weighted, there is not this kind of weighting among classes in the regular curriculum so physical education, home economics and algebra are all equally incorporated into the grade point average upon which the class standing is based.

In addition, students in our study attended differing high schools. Most students (21) from Fundamental attended HS-1 with attendance at HS-2 second in rank (14) and HS-3 third (11). Most students (130) from C-1 attended HS-3 with only 9 attending elsewhere and almost all students (92) from C-2 attended HS-4. When we average across grades 10-12 on the basic composite score of the Test of Academic Proficiency (TAP) for the 1989-90 school year, we find the HS-1 and HS-2 are at the district mean on this score and that HS-4 is 1.7 points higher and HS-3 is 5.8 points higher. This produces the following rank order of mean scores: HS-3 >HS-4>HS-1=HS-2. Obviously there is more academic competition at HS-3 (where C-1 students attended) and at HS-4 (where students from C-2 attended) than there is at HS-1 and HS-2 (where Fundamental school students attended). Given all these problems, we see class standing as an interesting but not terribly definitive variable.

School Activities and Participation. When we searched school year books for an index of student activities, we found Fundamental students held more leadership positions and participated in more activities than either of the other schools, but did not receive more academic honors. This was particularly interesting given the concern that strict discipline and restricted student interactions at fundamental schools produces students compromised in social skills (Weber, 1985). Our data indicate this is probably not the case and that Fundamental students participate in extra curricular activities as much or more than comparable students and obtain more leadership positions. This may be the result of several factors including the somewhat higher scholastic ability of Fundamental students, the obvious support and interest of their families and/or the probable preponderance of LDS students whose cultural background heavily emphasizes group participation and verbal interaction. Regardless of the reasons, it is obvious that concerns about the social skills of Fundamental students are unfounded and that they function well socially in high school.

SUMMARY

When we examine our original research questions we find that students from Fundamental school:

1. do not differ remarkably from our comparison schools except in a somewhat higher index of ability when compared with one school.

2. score higher than comparisons school students on some subscales of standardized tests at grade six but not at either grade nine or grade eleven. There are no differences in college entrance exam scores but there are differences in type of test taken.

3. do not take more advanced placement courses than comparison school students.

4. do not achieve more academic honors but do participate more in school activities and are found in leadership positions more often than are comparison school students.

5. exhibit somewhat differing rates of dropout and withdrawal than do comparative school students but no difference in absences. Fundamental school has a higher percent who withdraw to private or home schools and a higher percent who may transfer within the district.

This 13-year longitudinal study of the effects of attendance at a fundamental school upon students academic and social performances found an initial scholastic advantage for Fundamental students which moderated by ninth grade and remained similar to two comparison schools at eleventh grade. There were varying patterns in college entrance exams with Fundamental students demonstrating higher means but not significant differences. More interesting were the patterns where students from one comparison school took exams required by more challenging, out of state and private institutions while Fundamental students and students from one comparison school primarily took exams required by western state colleges and universities and religious institutions. When we examined student activities, Fundamental student participated more and held more leadership positions but did not attain more academic honors.

Despite years of controversy and heated exchange both on a national and local level, our study indicates that while there may be some participation differences, many of these could be the effect

of variables outside the school system. Short-term, fundamental students out perform comparison schools in math and some other subscales of standardized tests. Long-term, students fared equally well academically regardless of the type of elementary education they receive. Fundamental students perform well and remain excellent performers in high school, but then, so do students from the comparison schools. We are comparing excellence to excellence. What appears to be more important in the controversy is that parental philosophies often differ, making parents psychologically more comfortable when their children attend a particular type of school. This is characteristic of a heterogeneous, open society where people are free to have differing opinions and to express themselves and the district has adapted to provide a range of options for parents and children of varying persuasions. The important, underlying concern is not the dialectic involved, but the end result: how well do children learn? Similar children in our study learned about equally well in the long term regardless of the philosophical underpinnings of the elementary school they attended.

References

Anastasi, A. (1988). Psychological testing (6th edition). New York, N.Y.: Macmillan Publishing Co., Inc.

Apple, M.W. (1988). Curricula and teaching: are they headed toward excellence? NASSP Bulletin, September, 14-25.

Begley, W.C. (1938). An Essentialists' platform for the advancement of American education, Educational Administrator and Supervision, 24, 241-256.

Brandt, D. (1979). The Basic School Evaluation. (Technical report). Mesa Public Schools: Department of Research and Evaluation.

Dewalt, M.W. & Troxell, B. (1989). Old Order Mennonite one-room schools in Pennsylvania. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, March.

Education Commission of the States (1979). Changes in Mathematical Achievement, 1973-1978 (Report No. 09-Ma-01). Denver: National Assessment of Educational Progress.

Ellis, A.V. (1975). Success and Failure: A summary of findings and recommendations for improving elementary reading in Massachusetts City Schools. Massachusetts Advisory Council of Education, Boston. ERIC Document Reproduction Service No. ED 108 157.

Flavell, J.H. (1985). Cognitive development (2nd ed.). Englewood Cliffs, N.J.: Prentice Hall.

Franklin School Parent Handbook, (1990). Mesa, AZ: Mesa Public Schools.

Gerard, W. (1977). Back to basics? That's nothing new. Toronto Star.

Guilford, J.P. (1967). The nature of human intelligence. New York: McGraw-Hill.

Gutek, G.L. (1981). Basic education: a historical perspective. Bloomington, Indiana. Phi Delta Kappa Educational Foundation.

Jennings, M. (1983, May 15). Franklin's basic course is loved, misunderstood. Mesa Tribune.

Jones, P.G. (1976).. All about those new "fundamental" public schools, what they're promising and why they are catching on. The American School Board Journal, 163, (2), 24-31.

Mason, H.M. (1990). Personal interview. Notes in possession of author.

Mason, H.M. (1980). Fundamental alternative schools and neighborhood schools: an analytical comparison of principal perceptions. Unpublished doctoral dissertation proposal, Copy in possession of the author, Arizona State University, Tempe.

McCowan, K. (1989, October 16). Schools try ideas from past. The Arizona Republic.

McGowan, D. (1979, June 13). Mesa studying back to basics approach for school. Arizona Republic, B-1.

Meyer, A.E. (1949). The development of education in the Twentieth Century. Englewood Cliffs, N.J.: Prentice Hall.

Neil, S.B. (1976). Pasadena's approach to the classic school debate. American Educator, 12, (3), 6-10.

O'Bryan-Garland, S. & Parkay, F.W. (1985). Back-to-Basics: reflections of the past and a glimpse into the future. NASSP Bulletin, January, 29-33.

Palardy, Michael J. (1988). Back-to-Basics Revisited and Reanalyzed. Teacher Educator, 24, 2, 2-6.

Petchel, J. G. (1983, September 7). Basic school or traditional, concept is to teach kids. Arizona Republic.

Rosenholtz, S.J. & Cohen, E.G. (1983). Back to basics and the desegregated school. The Elementary School Journal. The University of Chicago, 83, (5), 515-527.

Snow, K. (1978, April 16). School seeks parents input. The Sunday Tribune, Mesa, Arizona: 19A.

Sternberg, R.J. (1977). Intelligence, information processing, and analogical reasoning: The componential analysis of human abilities. Hillsdale, N.J.: Erlbaum.

Taylor, B.L. & Birchell, G.R. (1983). Has the 'Back-to-basics' movement influenced elementary social studies textbooks? Paper presented at the annual conference of the National Council for Social Studies, San Francisco, November.

Weber, L.J., McBee, J.K., Burton, J., & Wildman, T. (1985). Fundamental and regular elementary schools: Do differences exist? Paper presented at the 8th annual meeting of the Eastern Educational Research Association, Virginia Beach, VA., Feb.